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ADVERTISING CIRCULARS.

Methods of the Public Service Gas Company of New Jersey.

By H. THURSTON OWENS.

To attract the attention and create the desire to purchase amongst 2,000,000 people, living in 150 cities and towns spread over most of a State, is a problem that must be attacked with intelligent effort, from many angles, and by a well organized staff.

The New Business Department of the Public Service Gas Company, of New Jersey, headed by R. R. Young, has given a great deal of attention to the work of getting the proper kinds of printed matter into the hands of the people for whom it is intended. All the publicity and advertising matter is designed and prepared at the executive offices in Newark, and from there sent for distribution to the divisional circularizing departments at Camden, Elizabeth, Jersey City, Paterson, Hackensack and Newark. Some of the advertising is intended for use by the salesforce, while others are mailed direct to "prospects," which number upwards of 25,000 for ranges and 30,000 for water heaters. There are 26 show rooms in the communities served, and the circulars are designed to assist the salesforce as well as bring direct inquiries for goods.

It is probably true that not over 10% of the printed matter supplied by manufacturers to Public Utility Companies ordinarily reaches the prospects; and it is a matter of considerable satisfaction to the "Public Service" to be able to say that the distribution of their advertising matter, as well as that furnished by manufacturers, is done systematically.

There is keen competition in circular advertising, on account of its popularity rather than its effectiveness. The size of your mail may be forecasted by the number of blue books, directory's etc., in which your name appears, and because of this abundance no expense is spared to prepare and send out the kinds of circulars that will have the best chances of being read and considered. Take the store lighting folder "Ask an Authority." The color scheme is blue, black, red and yellow; and if it, is opened it will be read, as the matter addressed to the merchant, has to do with the success of his business. Every merchant is interested in good lighting, and the more they are encouraged to keep up to date the more lighting business there will be, both gas and electric. Some of the data given inside this folder reads as follows:

The style, color and arrangement of these circulars appeals to the eye.

"There is one light which fills all the requirements of the store of to-day. It is Modern Gas Light. It is the next thing to daylight; steadily sustained, clear white light.

"But it must be properly installed — intelligently placed—to produce the best possible results from a given number of lamps. It must show your goods at their best. It must be restful to the eyes of your employees and your customers.

"To insure proper installations is the purpose of our Lighting Service. By this we do not mean the mere piping of your property and the installing of the lamps. Our Service means far more than that and begins the moment your need for artificial light begins.

"Your store lighting is a big factor in your business success. Don't slight it. Don't deceive yourself as to its importance."

This is one of a series of five folders now being mailed at intervals of 3 weeks to all store keepers and manufacturers.

The others shown in the group are for office and salesforce distribution.

The circular "My Wife" contains the offer of a 60-day free trial of a Cabinet Gas Range and a Water Heater, and is intended especially to further the installations of all-gas-kitchens.

The "You will be Surprised" folder covers Room Heaters; and part of it's matter will give an idea of the style used, and of the care exercised in its preparation.

"In homes where we have installed Gas Fire-place Heaters and Gas Logs, our customers tell us how agreeably surprised they are at the satisfaction these heating appliances afford them. This is not to be wondered at, as most people who have not used the lastest type of Gas Heating Appliances are not familiar with the progress that has recently been made in their construction.

"And since in all houses some auxiliary heat is absolutely necessary at times, we feel that our patrons are interested in knowing what are the latest and best gas heating devices. We have, therefore, issued this folder in which are shown a few types of Gas Heaters of attractive design and which, because of their scientific construction, radiate the greatest amount of heat at moderate cost."

Make yourself at Home" is about lighting; and one of the things emphasized is the following:

"Yes, it is possible to secure the most artistic of lighting effects with gas, and have fixtures that afford a convenient method for lighting and extinguishing the gas. And when it comes to the quality of the light itself, no light has the peculiar properties which gas light possesses, properties which make it the ideal light for reading, sewing, or studying. It is the light which oculists know is agreeable to the eyes, the best light money can buy."

Can you imagine a more cheerfully lighted or more cozily heated living room?

The New C. E-Z. Gas Light is the most advantageous light procurable from the standpoint of economy and efficiency.

For reading it is ideal, having a soft effect which eliminates eyestrain.

The Return Card.

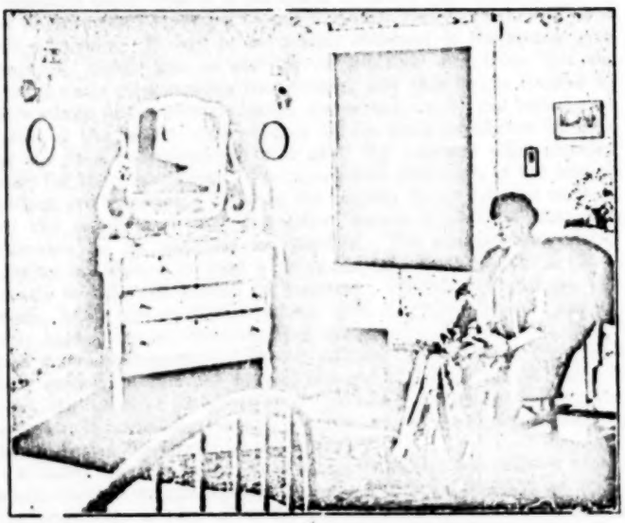
A feature of direct mail advertising which should not be overlooked, is the return card. Many people send out circulars without return cards, and wonder why no answers come. You must make it easy for the prospect to tell you of his wants. Every piece of advertising sent out with the exception of blotters, fans, etc., includes a return card addressed to the Company on one side, and on the other there is room for remarks and the name and address of the sender.

Blotters.

Some of the illustrations used on blotters are shown on this page, and it is to be noted that they all show the goods in use and in attractive surroundings. This is one of the reasons why most of the publicity matter is made up by the company itself, as they realize the importance of tempting the prospect by showing illustrations of homes equipped with the things they have for sale, rather than just a picture of the goods. Most of the literature sent out by manufacturers contains good cuts of the appliance, although some still feature their factories, office buildings and other real estate, and few show the goods in use.

Prices Always Given.

"Every article has its price" and every piece of advertising matter states the price. The finest dry goods store in America, B. Altman & Co., do not allow people to see the goods in their show windows at night, they pull down the blinds; but they price all goods in their advertising matter. Gas companies can go Altman one better by lighting up their show windows as well as pricing their ads. By pricing a article you are one step nearer a sale, and by announcing *either* an advance or a cut in price, you get another step nearer.



C. E-Z. lights with pretty silk shades add a touch of daintiness to a bedroom.

When the mornings are cold and the furnace fire is low, one gets chilled through.

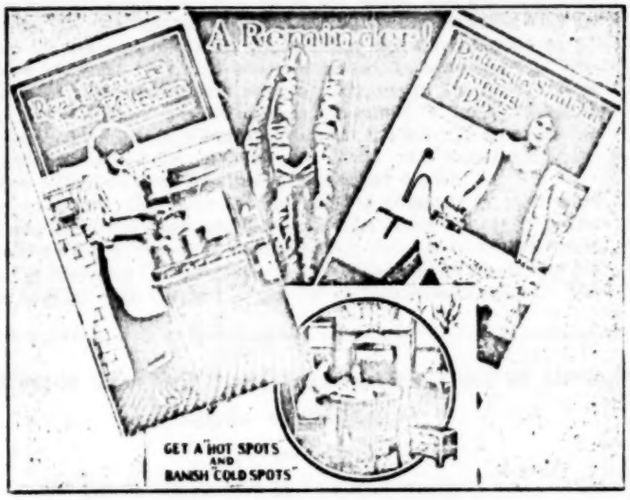
What you need for the fall and winter mornings is auxiliary heat, for it is a long while before the farnace fire takes the chill out of the air.

Wouldn't you take pride in having a handsome fixture like this one?

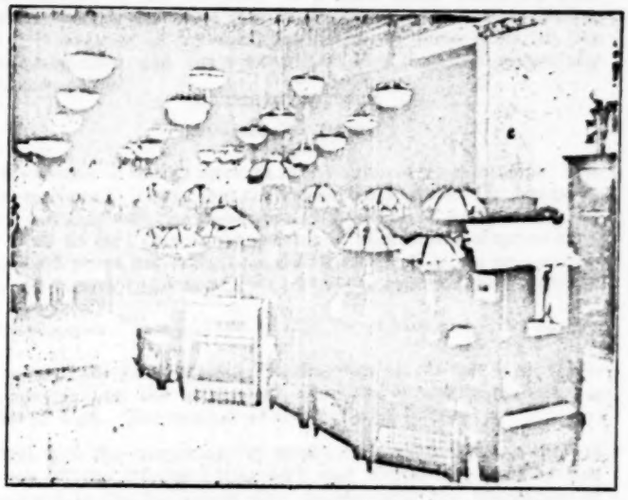
The Clover Gas Fixture is a decided departure in the design and construction of gas lighting fixtures—discoloration of metal being entirely done away with.

The golden amber glass dishes are readily removed for cleansing without danger of breaking.

The decorative knob at bottom of fixture can be unscrewed and a percolator, reading lamp, portable heating stove or one of many other appliances attached. It is beautiful in design and convenient to operate.



When the Representative has given one of these circulars away he feels that his sales' efforts will be aided.



"The Atmosphere of an attractive office such as this will make prospects visit a pleasure."

The subjects covered by the group shown on this page are as follows; "A Reminder" has a piece of real string tired around to the middle finger, the reminder being the fact that during lighting week, a reduction of 10% was made on lighting goods.

"Real pleasure in the Kitchen" is another All-Gas-Kitchen folder; and the piece of lace shown on "Putting a smile in Ironing Day" should interest every woman.

Showing The Goods In Use.

The aim to have every home make full use of the service offered can be attained by giving good service, and by continually reminding people of the improvements in design and construction as well as the convenience of modern gas burning appliances. Make your pictures tell as much as possible of the story, illustrate the goods in use, show that others ARE getting pleasure by using the modern and "Up to date" things.

The Public is not "One of the Family."

Many Companies treat the Public as though they were one of the family, and take it for granted they will be interested and amused when they call. The woman spends most of the money and nothing will attract her attention and hold it as well as attractive lighting features. The importance of this is realized by the Public Service Gas Company, and their display during the "Holidays" at Newark (illustrated in the last cut) shows what can be done. It will not pay to send out attractive circulars to prospects unless you have something equally interesting to show at the Salesroom, and some one competent to sell them.

COMMERCIAL LIGHTING.

Paper by E. M. Colquhoun, to the International Gas Congress.

Commercial lighting embraces the lighting of stores, factories, churches, halls and other places of a public or semi-public nature; and since the introduction of electric lighting, it is in this field that gas has met the most severe competition. In a picture of the interior of John Wanamaker's department store in 1876, it is noticeable that the illumination was by open-flame gas burners. To-day, Wanamaker's is lighted by electricity. This instance is indicative of the trend in the past; and yet to-day, despite the loss of some classes of business, the sales of gas for commercial lighting have increased, although the proportion to total sales is less, due to the large increase in the sales of gas for fuel

The increase in commercial lighting sales has largely been made possible by the adoption of a higher standard of illumination. With the increase in the amount of light required, there came a demand for increased efficiency and more artistic effects. Present-day gas lamps compare favorably with the electric units, and have nothing to fear from a comparison based on appearance. Gas still leads in reliability, though electric outages for store lighting, which made a decidedly favorable argument for the use of gas, are not as prevalent to-day as formerly. In efficiency, which leads to economy, gas has always successfully met electric competition, but this factor is now more seriously involved than heretofore, and the advantage of economy in operating costs, formerly so beneficial to the gas industry, does not exist to the same extent to-day.

In considering the comparative costs of illumination by gas and electricity, there must be taken into account the cost of gas or of electric energy, the efficiency of the units used, and the cost of their upkeep. A few years ago, the average medium sized store could be illuminated by three upright arc lamps, at a cost of $76 per year, including gas and maintenance. The cost to illuminate such a store by electricity with carbon lamps, was about $385. The inverted gas arc lamp made it possible to light a similar store for $55, compared with $95, using Tungsten lamps. To-day, with the most efficient units available, the cost would be $51 for gas and $60 for electricity.

In the above comparisons, gas is figured at $1 per 1,000 cubic feet, and electricity at 10 cents per kilowatt hour; and, while it is true many companies are selling gas much lower than $1 per 1,000, it must be recognized that electric companies have largely adopted the demand system of charging for current, and, though the base rate for a few hours' burning may be 10 cents per kilowatt hour, the excess after about 1 hours' average daily burning is secured at a much lower rate. For the average commercial installation this would mean that a low rate would be secured for the current used in excess of $3 per month, and in many instances for much less than this amount. The newer lamps, with their lessened demand, will result in a still lower amount to which the base rate will be applicable. However, the costs of illumination with gas and electricity have been decreased principally by the increased efficiency of the lamps. To-day, 32-candle power is secured with a consumption of 1 cubic foot of gas, as compared with 17-candle power a few years ago, and the increase in the efficiency of the electric units has even exceeded that of the gas units; where it is now possible to secure 13-candle power with a consumption of 10 watts of current, a few years ago it was necessary to use 10 watts for 3-candle power. These figures show that the power of the old weapon—low operating costs for gas—has decreased materially.

The problem to-day is not only the devising of methods to secure additional business, but more important still, the holding of present business; and in this respect the first consideration is service—service that the consumer, not the gas company, calls good. This must be given through a maintenance department. Whether the maintenance is free or charged for, it must be the best; and an es

sential thing is the employment of well trained mechanics. With the adoption of merchandizing principles by the gas industry, the tendency has been to decrease the operating costs of the new business department. Maintenance, however, is a poor branch of the business in which to attempt economies, unless it is carefully considered where they will lead. If economies are instituted by reducing the number of calls and the quality of the maintenance materials, consumers will not be likely to complain, but rather will be receptive to the argument of competitors.

One company, during the past year, showed a profit of $3,700 in its maintenance account, maintaining 35,000 lamps, and giving excellent service. It was possible to secure this profit through increased efficiency on the part of the maintenance force, which was attributed largely to an advance in the wage rate to the men resulting in more and better work. The installation of newer lamps, more easily maintained than the older types, also helped to reduce costs. This particular company realizes that maintenance is not an account in which to expect large profits, but a branch of work in which the best of service must be given at the minimum expense to the consumer. It has reduced the price to the public for maintaining a single mantle arc from 30 cents to 20 cents per month, and even less where 4 or more lamps are in use; a reduction of but 10 cents per lamp per month, but amounting to 33%. Other reductions are contemplated, as, where possible to effect them, they are beneficial to the business as whole. This is especially true where the reductions are well advertised, for without advertising they largely lose their value.

In a book of instructions that your electric competitors issue to salesmen, the statement is made that "thousands of gas arcs of an obsolute type are installed with scarcely any regard to the requirements of the situation; are equipped with poor quality mantles; are not properly adjusted, and in practically every case have fallen off in candle power with use. If it so happens that the lamps in question are in good operating condition, the salesman will often find that the customer is getting much more light, just then, than he actually needs. The real reason for this is that the gas company knows that it is necessary to supply a man with more lamps than he ordinarily needs, to take care of the times when the lamps are a little out of adjustment, or the quality of gas is poor and the pressure low."

This statement is absolutely incorrect, and, while possible such conditions existed in some companies, several years ago, to-day it could be disproved by any of the companies represented in this Association. The necessity of supplying gas of a uniform calorific value, purity and pressure is recognized by all gas companies. That commercial gas lamps require careful maintenance is also realized, and consumers are given maintenance service, so that the lamps are kept in good operating condition. It is unnecessary to supply an excess number of lamps for the periods of poor service, noted in the quotation, because these periods do not exist. The statement is founded on theory, for such a condition is possible only if the primary things of the gas industry are neglected; if, by chance, any manager present recognizes the statement as applying to conditions in his city, no time should be lost in making the necessary correction to eliminate the condition, for correction is easily possible.

Commercial lighting is not a class of business for which the prices and selling plans of other cities can be adopted, unless conditions are carefully analyzed, particularly as regards competition. It is not business in which spasmodic campaigns will produce the best general result. Time and again reports are heard of wonderful results secured by aggressive selling campaigns on commercial lighting, but in many instances the results have not been permanent. Reserve the special campaigns for securing undeveloped classes of business such as water heating, for there aggressive campaigns with a special force will bring quick results, but for commercial lighting, it will generally be found that the consumers secured in a rush are the kind that are as quickly changed to some other form of illumination; while the majority of the business is of a more substantial nature, and, if carefully secured, can be retained by a good installation and good maintenance service. Care in a sale does not mean lack of agressiveness, but rather the close study of the consumer's needs.

From time to time the advantages of a rental system of installing arc lamps, compared with the sales plan, have been discussed. These questions must be decided by each company according to its needs and the nature of its competition. However, in the average city, the long-term payment plan of selling lamps, covering a period of from 12 to 24 months, has been largely adopted; because it has the advantage of a low first payment, making it easier to secure business, which is one of the arguments in favor of the rental plan, and embodies the principle that if the consumer has made an investment in his lamps, he is not so liable to change quickly to some other form of illumination; in other words, the business is of a more substantial nature than under the straight rental plan. Recognizing, however, that a lamp not properly maintained is the worst of advertisements, it is essential that any sales plan include maintenance service.

When a salesman is figuring the cost of lighting with a prospective customer, the question of operating costs arises. In order to compute these costs it is necessary to know the burning hours, and the merchant must not be relied upon to give this figure off-hand with accuracy. It can be accurately obtained if the annual consumption, either gas or electric, is secured, and from this the average daily consumption determined, and this figure divided by the wattage of the electric lamps connected, or, if the installation is gas, by the hourly consumption of the units connected (deducting the pilot consumption), will give the average daily burning hours for the installation. Too frequently estimates of the cost of lighting are inaccurate because the buring hours are not correct, and the severity of the competition makes it essential that such estimates be as accurate as possible. The average commercial lighting installation is used 4 hours per day, but this figure varies greatly in different classes of business. Clothing, furniture, dry goods, tailor and hardware stores, will average 3 hours' use per day; barber shops, bakeries, and stationery, grocery, meat and shoe stores, will average 4 hours; saloons, restaurants, cigar and drug stores, from 6 to 7 hours; and halls, offices, etc., 2 hours or less. An attempt to apply such figures to individual consumers, however, is misleading, and it is better to secure accurate data on the operating conditions of the prospect.

In some cities, a great many store buildings are erected to-day where there is no gas piping; in some instances, as many as 50%. The possibility of ever securing gas lighting in these buildings is remote. Perhaps piping cannot be secured in every store building, but make sure that every effort is expended with the architect, builder and prospective tenant. The advertising value of installing gas in new stores, both upon commercial lighting business and upon residential lighting business, is very great, although not easily calculated. No one can give greater assistance in the piping of new buildings than the architect. While many realize this, they do not give the matter the attention it deserves, and are too frequently content to have the architects approached only by salesmen, who, from the nature of their position, find it more difficult than would the manager, to establish the relation the gas company should have with the architects.

A frank statement regarding the comparitive cost of the two leading forms of illumination might give a pessimistic impression, but it is intended to lead to optimism, for it is only by an analysis of existing conditions that means can be determined that will retain old business and secure new business. Many gas company managers are either too pessimistic or too optimistic regarding gas lighting, because they have not given the subject intelligent thought. If commercial lighting business is being lost, analyze conditions. Failure to show a gain in sales of gas for commercial lighting is not necessarily because the growth of the total volume of business is slow, for the tendency is away from the spectacular effects that bring large consumptions, and lamps are more efficient and require less gas. This is indicated by a list of 211 stores, taken at random from the ledgers of one company, that in 1904 used $20,573.30 worth of gas for lighting, and in 1914, $18,079.07—a decrease of 12%. The decrease can be accounted for by the increased efficiency of gas lamps.

In a city where the average rate for store lighting is 90 cents per thousand cubic feet for gas, and 6 cents per kilowatt hour for electricity, the sales for commercial lighting amount to but 6% of the total sales of the gas company, and are decreasing (15% is said to represent the average proportion for most companies). Although this company has a large number of arc lamps in service, this is not an indication of the gas business they are securing, for here, as in a great many cities, the lamps are used for auxiliary purposes only. This latter condition is due, either to the better service the consumer is securing with electricity, or because the price of gas is too high to compete with present day electric units. Under either condition, there is no incentive for stores to use gas lighting. To increase the use of gas for commercial lighting, the cost of operation must be reduced. Even more than increased mantle efficiency, a more economical method of ignition is needed, for the present pilot system is too costly. Pilot consumption in the average store is one-fourth the total gas consumption; some other reliable ignition system would give gas a tremendous lead in economy of operation.

The average store uses only three arc lamps, and a sliding scale of rates for gas usually includes at least 10,000 cubic feet per month in the first block, so the medium size stores secure no advantage from the rate. Electric companies, by adopting the "demand rate" for commercial lighting, frequently provide for rates lower than the base rate for current consumed in excess of about one hour's average daily burning, and for the average store having a connected load of one kilowatt, the lower rate would apply for current consumed over 30 kilowatt hours per month.

Do you know the rates of the electric company in your city? You may know the base rate, but have you given any study to the average cost of current for store lighting, which is invariably lower than the base rate? Have you compared the cost of electricity for store lighting with the cost of gas for various sizes of stores? The rapid increase in the efficiency of electric lamps makes the comparative costs of the two means of lighting so much closer to-day, that it is essential to know all the details of these costs, if, like other merchants, you want to devise plans that will successfully meet competition.

Increased Tar Prices.

An example of the big increase in the value of tar is noted in "The Doherty News." It says that the Pueblo Gas and Fuel Co., has made a new contract with the Inspiration Copper Co., of Arizona for the sale of all its tar. This company recently purchased the tar accumulation of 3 years, but will now pay an increase of 1½ or 4c. a gallon. This will mean a revenue of about $1,000 a year for the Pueblo Co.

A Simple Method for Determining Cost of 1000 Pounds of Steam.

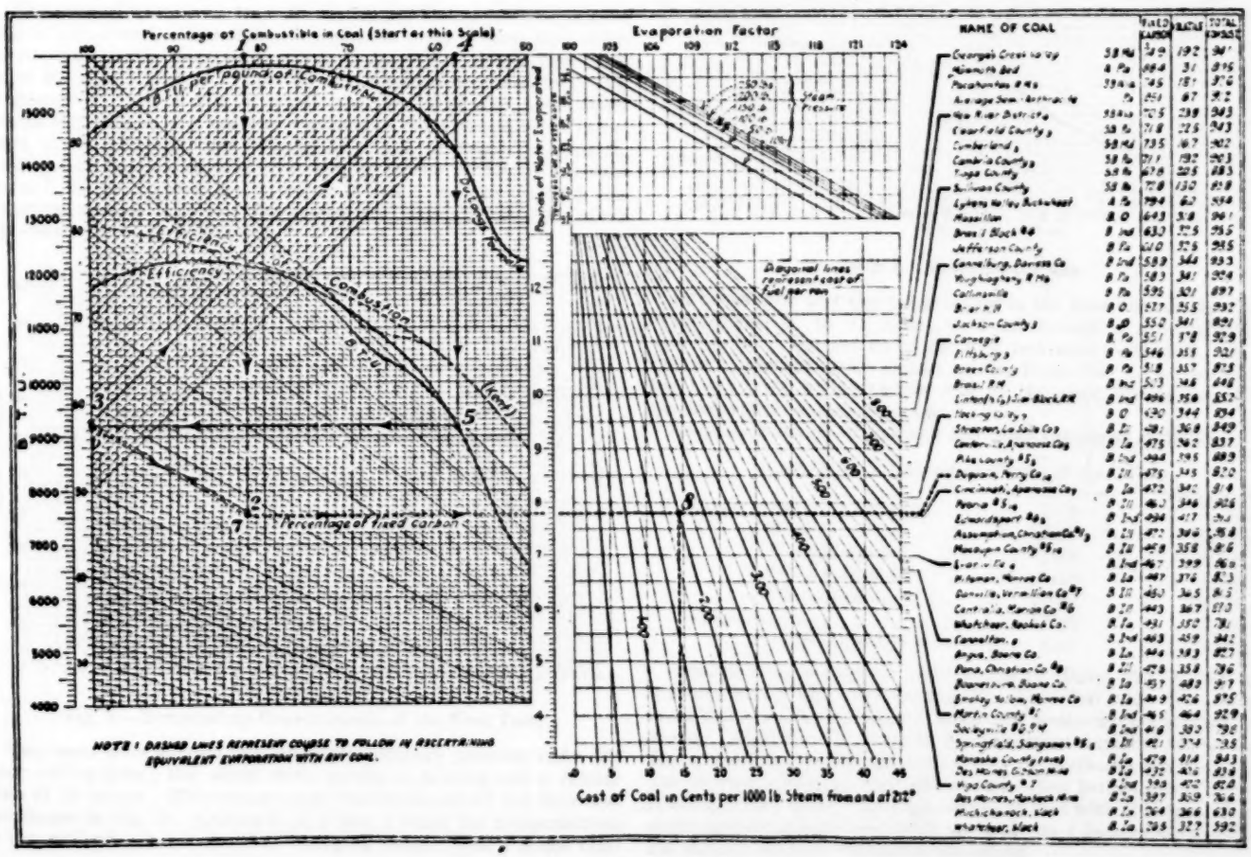
[By W. H. Schott in "Electric World."]

The accompanying chart has been devised to give quickly the cost of fuel required to produce a 1000 pounds of steam. If the fuel is listed in the column at the right, it is only necessary to follow the arrow opposite the particular fuel to where it intersects the diagonal line representing the cost per ton, and then drop vertically to the scale giving the cost of coal per 1000 pounds of steam from and at 212° Fahr. Refer next to the evaporation chart above, and follow the horizontal line from the feed-water temperature until it intersects the diagonal line representing the steam pressure. Directly above will be the evaporation factor. Multiply this factor by the cost of fuel per unit of equivalent evaporation, and the cost of coal to produce 1000 pounds of steam is determined. The arrows opposite the fuel in the column at the right of the chart point to the amount of evaporation that can be expected from burning 1 pound of the fuel.

When the fuel considered is not in the list the proportions of combustible and fixed carbon must be known, and the evaporation per pound of fuel estimated. After this is found the procedure is the same as for fuels listed. The diagram on the left is to facilitate ascertaining the equivalent evaporation obtainable with a pound of fuel. The method of using it is as follows:

Start with the percentage of combustible matter in the fuel (at the top of the left-hand diagram) and follow the vertical line downward to the horizontal line representing the percentage of fixed carbon, thence upward along the diagonal line to the left-hand margin, where the percentage of carbon in the combustible will be obtained. From this point proceed upward along the diagonal line to the top margin, then downward along the vertical line to the efficient B.t.u. curve and horizontally to the scale marked B.t.u. (which gives the calorific value on 1 pound of combustible). From this point again follow the diagonal line downward until it intersects the vertical line marked with the percentage of combustible in the coal and thence horizontally to the scale marked "pounds of water evaporated."

These charts are based on the efficiency that should be obtained with high-class operation. The upper curve in the left-hand diagram is based on Du Long's formula for figuring the B.t.u. in the combustible. The dotted curve is for determining the efficiency that should be obtained when burning coal under good conditions. The basis for charts similar to these was furnished by the author to the station-operating committee of the National District Heating Association for presentation at its convention.


Percentage of Combustible in Coal (Start at this Scale)
B.t.u. per pound of Combustible
Efficiency
Percentage of Fixed Carbon
Evaporation Factor
Pounds of Water Evaporated
Diagonal lines represent cost of fuel per ton
Cost of Coal in Cents per 1000 lb Steam from and at 212°
NAME OF COAL
NOTE: DASHED LINES REPRESENT COURSE TO FOLLOW IN ASCERTAINING EQUIVALENT EVAPORATION WITH ANY COAL.

Selling Gas Service.

[Paper by GEORGE WILLIAMS, to the N. C. G. A. Convention at Washington.]

The uses for heat are multiplying and they will continue to multiply—but to serve more customers with gas, and consumers with more gas, more and better salesmen service is needed.

There is no magical short-cut between an ordinary output of gas and a larger one. The sale of gas is not exempt from the same expert sales work that has been essential to every other great manufacturing and mercantile achievement.

From the standpoint of commercial progress, it is unfortunate that gas companies acquired a great portion of their business without solicitation, for there are many examples in other lines of business where an expert sales organization was the sole method by which the products were successfully put on the market. In creating a market for goods for which there was no demand, they built scientific sales organizations.

Gas companies to-day are confronted with a selling problem, and it is tremendously big. Engineers have made it easy to supply gas service. The town is rare that can justly claim to have "poor gas." The merchandizing problems are very much slower to solve.

Connecting the work of the gas maker with the growing wants of the user, requires more attention than has been given to it. It requires more engineers and more real salesmen. Salesmen are scarce, and they always will be, although almost any man who will apply his energies to it can become a capable salesman, if directed by men who have had experience in the business and possess consistent conception of the possibilities in it.

Now is a good time for men with technical training to become salesmen; also the time for salesmen to acquire more technical knowledge. It is the time for every company to recognize new business departments; time for every company to put itself in an attitude, toward the public, of *desiring* more business.

This year might be considered an epoch in the gas industry. Companies that have existed on a sort of retail trade must now make preparations for a wholesale business. The industrial world is undergoing most radical revolution. Hand tools are supplanted by power, coal by gas, electricity and oil. The gas men are doing the least in adjusting themselves to the new conditions. Rates are going lower. Few companies will be able to sell gas at a profit, unless their output is greatly increased, and that big output requires supervision of the installation of the proper appliances. If there ever was a time when the gas industry needed the work this Association is trying to promote, it is now. The company of to-day and to-morrow will be the money-maker, or not, according to its organized selling ability.

A gas company has a character, and makes some kind of impression on the community it serves, just as an individual salesman does on customers. Before the salesman can achieve satisfactory results, a proper organization for the work of his department is necessary; but before this in importance, is that position of the company which coresponds to "personality" in the man. The company's property, its appearance, its style of doing business, the tone of its advertising, the order of its salesrooms, their location and its attitude, all have a great deal to do for the best representatives it can send out. The public detects and detests in a corporation, boot-licking, hypocrisy, littleness, snobbishness or sloppiness, as it does in people. The public recognizes sound principles, it suspects a loss to stockholders or an unreasenable price for gas, if appliances are sold at a loss.

The gas company cannot ignore these general principles of business, so vital in all successful institutions along other lines of effort. Important details of the greatest American business organizations are looked at indifferently by many gas companies; such as the exhibit of goods, education and compensation of salesmen, records of chances for selling, experiments, looking for new outlets for the products, location of salesrooms, inspection service for the larger or complicated installations. These, and many other details important to other corporations, are just as profitable applied to ours.

Every town has representative branches of great national corporations—five-and-ten-cent stores, theatres, newspapers, cigar stores or department stores. All of their methods, of course, are not ideal; but the local management of the gas company is too busy, and sometimes too great a personage, to get around and study the methods that $50,000-a-year men have devised for building business. In many towns at this moment more oil (in value) is being shipped to factories than the entire earnings of the gas company, and used for many operations where gas would excel the oil as fuel. Gas men are delinquent in cashing-in on common commercial opportunities.

The making of pianos, sewing machines and automobiles was in pioneer days a marvel, but a simple process now compared to selling them. Gas service also needs more trained talent now to sell it, than to make it; and the talent lies in being able to sell it for various forms of service. This talent cannot be commanded at two or three dollars per day per man, and is not floating over the country looking for work. It has to be trained, and trained by an experienced organization.

We handicap ourselves with the assumption that the public knows more than it actually does about the service we have for sale. We fail to provide facilities to find the numerous products and operations than can be favorably affected by the introduction of gas. The uses for heat that might be found in many manufacturing concerns far exceed the uses for power. Opportunities for good patronage are delayed, to-day, by the need of trained salesmen. These delays may require years to recoup. Just from lack of solicitation and demonstration or intelligent explanation, oil or electric equipment may be installed, and the new investment by the customer postpones any other change. The manufacturer gets rid of coal, which is the important thing to him. We cannot expect the customers to wait forever on us, nor to adopt our set ideas as to their progress.

Merchants long ago indicated that they wanted individuality in their lighting. We were slow to show them the easy way. We thought only of selling gas, and they wanted lighting service in variety. They wanted show windows lighted every night, with dusk till midnight service—this was very important advertising service to the store, but we only thought of selling gas at the meter and not of selling advertising. It was no harder to devise a shut-off for gas than to make the electrical switch. Again, homes and restaurants that required large and well made equipment, found only the cheapest kind at the local gas office.

Merchandising has been neglected, or conducted at a loss. The public is ready to pay a profit on appliances, installation work, and for expert salesmen and demonstrators. It pays for these things on nearly everything else it buys, and pays cheerfully. The public is not as stingy as we think it. It does not begrudge instructive advertising or convenient and attractive show-rooms. It knows that these things broaden the output, in time lessens the price, and is consequently a saving to it. It likes to see good service, and good goods, buy them and have them delivered in style. It wants color and art on five cent grocery packages, and prefers automobile delivery to wagon.

To increase gas output it is necessary to increase the number and variety of gas appliances in use. Plumbers, gas-fitters, hardware dealers and department stores will not promote gas service with the interest that gas companies have in it. The gas company must sell appliances, if they are going to be sold on a scale that will result in a great increase of gas sales. There is no need of taking a loss on appliances. It requires a selling organization to do this work, backed by the idea prevailing in every other department, that the company wants more business.

Few companies within the next few years will be able to show a profit, unless their output is enlarged considerably. The next ten years will bring more remarkable changes than the ten that have passed. Every thing shows the need of greater commercial organization for gas companies. The public, the stockholder and gas manufacturer appreciate this.

In many companies the immediate establishment of a trained selling organization is an impossibility. Salesmen are not looking for positions, but enough men can be obtained to form sales departments for every company in the country. Each department requires team work. It requires a head who has himself sold gas service, and who can direct salesmen without tieing them down with a lot of picayunish rules. A great deal of work nowadays is technical and each department should include sufficient technical talent to cope with local necessities. Men who make good gas company representatives are not the kind that will work by a fixed set of rules or formulae. The manager may have the knowledge of the business and the ability to instruct his men, but unless he does so by suggestion and with sympathy his men will resent his rules, at least to themselves.

Salesmen have to use their own minds and methods; they should not be submitted to petty domination—they should work by a system; but orders for the service they are selling will, after all, depend upon their demeanor and courage.

The mere getting together of a number of men for this work is not enough. Their efficiency is enhanced, and training is necessary, by daily contact with each other. Daily meetings increase their

courage. Timidity in approaching new customers is a natural handicap to every salesman.

Selling is a profession, not a trade. The salesman will always have to have an organization with him in order to produce effective work. Selling departments, as well as companies, will always require systems, and must know their prospects and possibilities in detail. This is what is generally termed scientific salesmanship, the thing that has made every great industry in America what it is.

German Ovens Heated From Above.

A description by Prof. Simmershach, of an installation of Collin's coke ovens, near Hamm, Germany, is abstracted in "Iron Age." These ovens are heated alternately from above and below, and the tests noted record the influence on coking time, on temperature in the charge, and in the space above it, and in the composition of the gas produced. The illustration is a section through the flues, and gives an idea of the heating system.

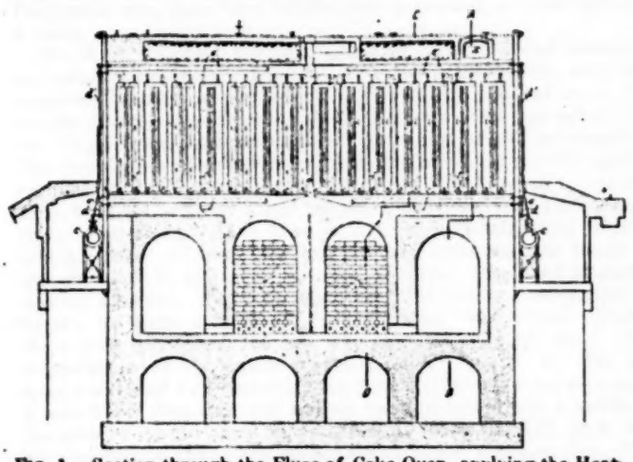


FIG. 1.—Section through the Flues of Coke Oven, applying the Heat from Above.

The washed gas comes from the condenser house to the mains *c*: and is introduced, alternately, through the pipes *d* from both sides of the oven at the same time, either to the lower distributing flues *e*, or the upper flues, e^1. The air for combustion comes from the regenerator, *f*, to a flue, *h*, under the length of the oven, from which it passes to the vertical combustion flues through the openings, *o*, and burns the gas entering at *g*; and on reversing from f^1, to a second flue, h^1, parallel to *h*, and by means of narrow vertical flues, *i*, to the expansions, *n*, where it meets the gas entering the combustion flues from e^1. The ovens are large, being 3.3 meters (10 feet 9 15/16 inches) high.

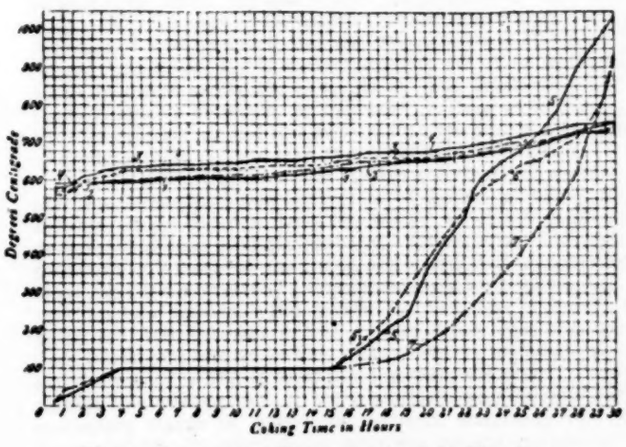


Fig. 2.—Temperature Measurements of the First Test.

Two tests were carried out, one with ordinary practice and a 30-hour coking time; the other with stronger heating and a coking time of 29 hours. The temperature measurements of the first test are shown in Fig. 2. Curves 1, 2, 3 and 4 show the temperatures in the gas space under the four charging holes. No. 5 is the temperature in the charge one meter from the bottom under the first charging hole, the one nearest the gas collector; No. 6 in the same position, but under the second charging hole, while No. 7 is in the charge 2.2 meters above the bottom, under the third charging hole.

The temperature in the space above the charge was very uniform and an average of slightly over 24½ hours was required before 700° C. was reached, which means that it was only reached at the last part of the coking period. Compared with the Koppers oven, the top temperatures were very low, and the roof much cooler. The temperature of the charge does not begin to rise above 100° C. until the fifteenth hour, and rises more quickly in the pusher side, because the oven there is narrow and heat conduction is better. The highest temperature reached was 1,035° C.

Table 1.—Per Cent of Constituents, by Volume

Test No.	Hours from beginning	CO_2 plus H_2S	C_nH_m	C_2H_4	O_2	CO	CH_4	H_2	N_2	Lower heating value, B.t.u. per cu. ft.
1	0 5	1 55	2 45	3 70	0 20	5 55	48 50	30 90	7 15	720 6
2	2 5	2 80	1 95	3 45	0 80	5 45	38 80	37 60	9 15	624 5
3	4 5	3 15	1 70	3 65	0 40	4 20	38 40	41 80	6 70	623 9
4	6 5	3 10	1 65	3 70	0 35	4 40	36 70	41 05	9 05	602 8
5	10 5	2 95	1 50	3 05	0 10	5 50	33 40	43 70	9 80	567 2
6	12 5	2 00	1 50	3 35	0 45	4 55	32 65	46 70	8 80	589 9
7	14 5	2 90	1 50	2 90	0 95	5 00	30 70	44 [illegible]	1[illegible] 25	540 5
8	16 5	2 10	1 25	2 90	0 55	4 90	32 55	49 65	6 70	560 9
9	18 5	1 35	0 95	2 70	0 45	4 75	33 85	51 50	4 45	565 9
10	20 5	1 00	0 75	2 65	0 50	4 80	32 95	46 05	11 30	533 5
11	22 5	1 15	0 60	2 60	0 45	4 20	31 25	52 10	7 65	526 2
12	24 5	1 25	0 30	2 15	0 55	4 75	27 05	60 20	3 95	491 3
13	26 5	1 10	0 15	2 05	0 10	4 60	28 20	60 40	3 75	497 4
14	28	1 15	0 10	1 30	0 60	5 35	15 30	63 55	12 65	353 5
15	29	0 95	. . .	1 10	0 25	6 80	12 60	62 35	12 45	342 2
Heating gas mixture		2 70	....	2 60	0 50	5 05	29 10	49 70	10 35	479 6

Analyses of the gases are given in Table 1. The samples were taken from the flue leading to the collecting main; and the results show the good influence of the low top temperatures. The moisture in the coal is completely driven off in the fifteenth hour (see curve No. 7). There is immediately a marked decrease in the benzol contents. In ovens with high top temperatures, the benzol soon disappears completely from the gas, but as Fig. 3 shows, in this case it is still found at the twenty-eighth hour, that is, almost to the end of the coking time. The influence of the lower top temperatures is also seen in the methane.

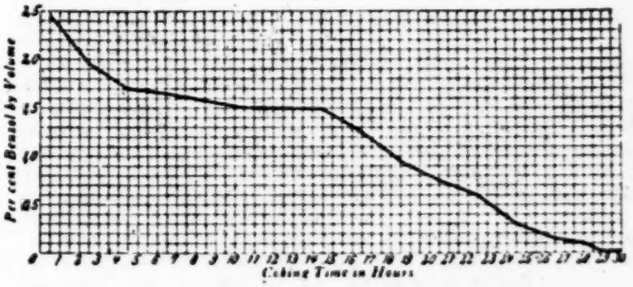


Fig. 3.—Benzol in the Gas.

In the second test the temperature in the space above the charge reached 700° C. in 19 hours, and at the end of the coking time was 785° C. The results of the first test were confirmed. In the charge the temperature began to rise from 100° C. at the end of the tenth hour, at the narrow end of the oven, and at the end of the thirteenth at the other end.

Average analyses of the coal and coke are given in Table 2.

TABLE 2.—*Analysis of the Coal and Coke.*

		Test 1. Per Cent.	Test 2. Per Cent.
Coal:	Ash	5.68	6.14
	Water	11.20	12.52
	Volatile matter	31.08	31.14
	Total sulphur	1.51	1.49
	Fixed carbon	68.92	68.86
Coke:	Ash	7.26	7.92
	Volatile matter	2.84	2.91

The small percentage of volatile matter shows that in both tests the coke was good. The results also show that with this arrangement for heating from above, high top temperatures are not produced. The 800° C., which is the minimum required in the space above the gas for the decomposition of ammonia is not reached. The alternate heating from above and below brings about an even heating of the walls with high ovens, so that with this method coke ovens could probably be built as large as 4 meters high (12 feet 3.5 inches) without trouble in operating.

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Secretary and Manager

NEW YORK, MONDAY, JANUARY 3, 1916.

Happy New Year.

The thought behind this wish is tinged with sadness and with hope when voiced by the thoughtful, as we are all affected by the havoc and desolation that has marked the past year. At no time have we been free of its pall. As may have been expected, the gas business was less affected than many others. The depression, which began way back in 1914, had not spent itself until long after the usual period of construction had passed last summer, with the result that practically all work was left over for this year.

Commercial activities were confined to very few locations a year ago, but each succeeding month saw more work being done; and the past Fall has witnessed some of the most successful selling campaigns ever conducted.

The value of a well maintained show room has been better recognized. In the smaller towns the average is still way below that of the Department store, both as to location and display. As far as window displays are concerned, the butcher and baker are still often several points ahead of the gas company.

Advertising has apparently had a set back, probably due to the business depression and tight money. Among the larger companies the use of newspaper space has been increased rather than curtailed; and the unusually large space used by one big company for Lighting Ads. indicates that many realize, if the business as a whole is to grow and prosper, the lighting end must hold its own. In order to get buildings piped so that they can get the heating business of to-morrow, they must have some of the lighting business to-day.

Concerted efforts were made on five different occasions to make a drive on some special appliance on a National scale. We give them in the order of their success:

Lighting Week,
Range Week,
Prosperity Week,
Water Heater Week,
Industrial Week.

We place Electrical Prosperity Week third on the list, because gas men knew more about this event than about the two that follow; and while it was electric, many competiting companies spruced up in self defence, and the combination ones did plenty of gas business.

These special weeks could be followed up to advantage, and we hope that they will be tried again in 1916.

In Association work there is little unusual to report, except that the Institute held a very successful convention at a place far removed from the homes of the majority of the members; and the Commercial Association held its show without admitting the public, which proved a decided success. No new associations were formed, but the organization of a manufacturer section in the N. C. G. A. makes quite a change in that body, especially as it has taken over the management of the shows.

The Institute has a new constitution which should aid in extending the scope and value of its work, and facilitate the affiliations of all state and sectional bodies.

The Institute must also be credited with the major portion of the work in connection with the International Gas Congress; which, allowing for the unavoidable absence of European representatives, was a very successful gathering.

The air is surcharged with optimism as the year opens; business is better, and is growing in volume and steadiness every week. The new construction work and necessary extensions should stimulate business all along the line.

We take this occasion to thank our many friends and contributors for their support and well wishes; and hope that we will be successful in our endeavors to get the gas news to them promptly and efficiently during the year just beginning.

Misleading or only Ambiguous?

The Committee of the N. C. G. A., which is charged with the duty of calling-down the users of misleading advertisements, should note these comments from "The Gas World," London, on an ad. of an American water heater, appearing in a magazine sent to English gas consumers.

"The company puts forward an automatic water heater which affords 'a steaming stream of boiling hot water costing little more than cold water.' We have never got so far in our claims in this country, but natural gas comes cheap in parts of America. Although this appliance is stated to be 'the most modern,' and 'over all others,' it does not seem as if we have much to learn from its constructional merits, which are thus extolled:

"'Simple—permanent—easily installed. Patented flash pilot light—semi-bunsen flame—spout flame burner; automatic top, shut-off and water regulating valves; two-piece piston—thermostat-non-collapsible, cast-iron draft equalizer, USED THE WORLD OVER.'

"It is not easily understandable what is the special significance of a 'semi-bunsen flame.' We are accustomed in this country to flames which are either bunsen or luminous, but how they can be 'mixed' to advantage in a water or any other kind of heater, is not obvious. What the special virtue of a 'spout flame burner' is, cannot even be conjectured. It is an expression new to the writer, as it doubtless is to other gas engineers. The claim that the heater is used the world over, is a little premature, seeing that it has not yet established itself in the British market."

Advertising with Circulars.

The more money spent on advertising, and the larger the force of solicitors, the nearer we come to a profit making appliance department. This has been the experience of the Public Service Gas Company of New Jersey, which in the quantity and quality of advertising matter used leads the country. In the article on this matter by H. Thurston Owens stress is laid on the use of return cards, but the results obtained should be judged by the sales, rather than the number of cards returned.

The educational value of the advertising is reflected in the quality of the goods sold, as well as by the quantity; as an instance, the percentage of cabinet ranges sold in 1915 was over 40 per cent., and more automatic water heaters are sold every year.

Lots of effective work can be done with circulars, but, as pointed out, they should be well designed and executed, and delivered at proper intervals to real prospects until they are "sold."

SPECIAL ENGLISH CORRESPONDENCE.

Monthly Letter From Norton H. Humphrys, Salisbury, England.

Mr. W. S. Curphey Experiments on the Waste of Ammonia in Gas Works.—De-Benzolized Coke Oven Gas for the Supply of Leeds.—The Coke Oven Managers' Association.

In previous letters I have occasionally touched on the importance of careful attention to the tightness of all wells or tanks that are used for the storage of ammoniacal liquor, whether below ground, or at high level. Perhaps this point should be accentuated in regard to small overhead tanks, as used for the supply of scrubbers or other apparatus, or as overflows in connection with the same, because the loss from a small tank, through which a constant stream of ammoniacal liquor is flowing, may be quite as serious, as from a large tank in which it is quiescent. These receptacles would seem more likely to escape attention, as I have frequently seen them very indifferently protected, or even without a cover.

Mr. W. S. Curphey, the chief inspector of sulphate of ammonia and other manufacturing works under the Alkalies, etc., acts, has rendered valuable service to gas engineers, by publication of the results of some experiments, carried out at various gas works under his guidance, with the object of obtaining definite information. The first series of observations was conducted on a 1,000 gallon rectangular tank, the cover of which was lifted, so as to leave a clear 1" space between it and the sides, and filled with ammoniacal liquor containing 1.15% free, 0.32% fixed, total 1.47% of ammonia. After 31 days, the loss of free ammonia was found to amount to 23%, and after 80 days, to 43%. The fixed ammonia was not affected. The tank was next filled with a fresh supply of liquor, to which a layer of oil, 1¼" thick, was added. Under these new conditions, the loss was only 0.5% in 80 days. The temperature of the liquor ranged from 57° to 73° F. For the second series of experiments, a horizontal cylinder boiler was used. It was 6 feet diameter, and had no opening other than a manhole, the area of which was 0.87 square feet. This was left open, but with protection from rain, as the vessel was in the open air. Ammoniacal liquor, containing 1.5% free ammonia, 0.35% fixed, total 1.85%, was run in, to a depth of 4 feet, and the temperature during the test was 70° to 75° F. The loss of free ammonia, after 79 days, was 21%, while the fixed ammonia had increased to 0.38%, indicating that some oxidation of free ammonia had occurred. The test was repeated, but with the addition of a layer of crude paraffin oil on the surface of the liquor, and in this case the loss of free ammonia during 79 days was only 0.4%. A third test was made with a 90 gallon iron drum, without lid, but placed under cover, containing ammoniacal liquor showing 1.36% free, 0.19% fixed, total 1.55% ammonia, and the range of temperature, during this test, was 46° to 57° F. The loss of free ammonia in 92 days was 39%. On repeating the experiment, with a layer of oil only 0.08" thick, the loss of free ammonia in 92 days was but 0.3%. Mr. Curphey remarks that exposure to the air means not only loss of free ammonia, but also the conversion of "free" into "fixed" ammonia, which necessitates the use of an equivalent of alkali, if it is to be utilized as sulphate. The simple means of preventing loss of ammonia, as indicated in these experiments, are worth consideration, and it is evident that the cost of a few gallons of crude paraffin oil may be a very profitable investment.

An arrangement between the Middleton Estate and Colliery Co and the Corporation Gas Committee of Leeds, providing for the delivery, at the Meadow Lane Gas Works, of 40,000 cubic feet of de-benzolized coke oven gas per hour, equivalent to 1,000,000 cubic feet per day is a sign of the times, and a matter of far wider importance than the interests of the parties immediately concerned. And that for two reasons. The scheme just outlined is nearly, if not quite, the first occasion in this country, when coke oven gas has been introduced into an ordinary gas works on an extensive scale; and the supply is first de-benzolized at the coke ovens. A private railway line passing both of the manufactories concerned, affords convenient means of connection, without disturbing the public thoroughfares, or interference with the general convenience. A 9" steel main—preferred to cast iron because the district abounds in colliery workings—is laid alongside of the railway track, and carried under the boundary wall of the gas works. Two boosters at the inlet end assist the delivery of gas, and there are two exhausters at the gas works, where there is also a meter to register the quantity of gas supplied. This push and pull arrangement could only be applied to a closed trunk main not used for distribution.

The gas as delivered is practically non-luminous with flat flame burners, and the calorific value is 400 B. T. U. per cubic foot. Before being sent out into the district, it is mixed with carburetted water gas, in such proportion as to secure a mixture that will show 500 B. T. U. per cubic foot. Complete control over this operation is obtained by the use of two registering calorimeters, placed side by side, which record the values of the crude and of the mixed gas. After several weeks work, the arrangement has been found quite satisfactory. The quality of the mixture is better than would be indicated by calculations based on the mean values of the two gases taken separately. As might be expected, because gas engineers have frequently had similar experience; a mixture of carburetted water gas and coal gas always gives higher results, both as regards the photometer and the calorimeter, than the mean based on the values of the gases taken separately. Gas engineers who supply mixed gas, and purify through one set of purifiers, will do well to effect the mixture, if not in the hydraulic main itself, as near thereto as practicable. From personal experience, I know that they will find it possible to maintain the desired quality of gas at the holder outlet, and at the same, reduce the consumption of oil.

The quantities of gas above named represent about one-tenth of the daily output at Leeds. So the gas committee do not run any serious risk, if there is a shortage of supply, or a temporary shut down at the coke ovens. But though their manufacturing resources are quite equal to the maximum demands, a large part of the plant is of such antiquated and uneconomical pattern, that its replacement by more modern apparatus has been under consideration for some time, but the condition of public affairs has shelved the question for the present. Even if unsuccessful in a financial sense, which is not at all probable, the arrangement is a great assistance to the gas committee, at a time when special difficulties are attending the raising of capital and the carrying out of constructive work of any kind.

The plant from which the supply of gas is taken, comprises a battery of 36 Simons-Carves ovens of the regenerative type. When coke oven produce has been utilized for ordinary gas supply, the practice hitherto has been to take only the earlier parts of the charge, and that at a point before it reaches the benzol extractors. The use of De-Benzolized and subsequently enriched gas is of the character described as a "new departure." I quite expect to have more to say on this point before long.

There are many gas undertakings, situated in military or manufacturing centres, struggling along with a plant barely equal to an unprecedented demand for gas, and possibly having uncompleted contracts for extentions on hand that cannot by any means be rendered available for service this winter, who would be extremely relieved and thankful, if there was a battery of 36 Coke Ovens and a million cubic feet of gas available, at a distance of two and a quarter miles from their works.

The by-product and coking industry of Great Britain has acquired sufficient magnitude to support its own special "Society," and the first meeting of the "Coke Oven Managers Association" was held a few weeks since. This addition to the ranks of technical representation is a close relation,—a sort of first cousin,—to the Institution of Gas Engineers, as the recovery and utilization of by-products, and the disposal of the residual gas, must always possess, more than an outside interest in the view of the gas Engineer. One of our periodicals runs a monthly "Coking Section," and there is much to be said in favor of the amalgamation of the new Association with the "nstitution," possibly under an affiliation scheme such as has been applied to the District Gas Engineer's Association, which would admit the retaining of separate individuality, as that would be, in all probability, a special point in the views of the promoters of the Coke Oven Managers' Association. It is strange, at a time when amalgamation and joining up of common interests is rife in the commercial world, that our technical societies, in a general way, appear to favor the opposite policy. But a perusal of the President's address will indicate that much mutual advantage would attend a joining up of forces. In taking up such subjects as by-products, or the utilization of gas, coke oven managers come within the pale of the gas industry. At the same time we find that gas engineers, in adopting regenerator

furnaces, chamber settings, vertical retorts, and benzol extraction apparatus, get on to the coke oven platform. The first President, (Mr. Geo. Chrisp) very appropriately opened his address with a resume of the early history of by-product coking. It is interesting to notice that he puts the secondary in front of the primary products; thus following the lead of the prominent gas engineer and chemist who asserted that the highest possible yields in respect to quantity and quality of gas, were not necessarily the only, or even the chief, considerations to be studied at the gas works. The gradual displacement of the "Bee-hive" pattern, by the retort-oven next received attention, after which consideration was directed to the Simon-Carves and other types of regenerative ovens.

The questions of compressing machinery and quenching and handling of coke received notice; and these are in no sense novelties to the gas engineer, and as much may be said of the necessity for maintaining the fluids in the hydraulic main in a consistency that will ensure their free passage to the storage well. The use of dip pipes has apparently been disregarded for some time, in connection with the coke oven hydraulic main. Such subjects as manufacture of sulphate of ammonia, direct recovery of ammonia in the form of sulphate, and extraction of benzol, are equally interesting in connection with the ordinary process of gas manufacture, and the last named especially attractive in view of the preceeding paragraph in this letter. The modern coke oven plant, as a rule includes rectification installations.

FREE MAINTENANCE.

Experience of the Christchurch Gas, Coal and Coke Company.

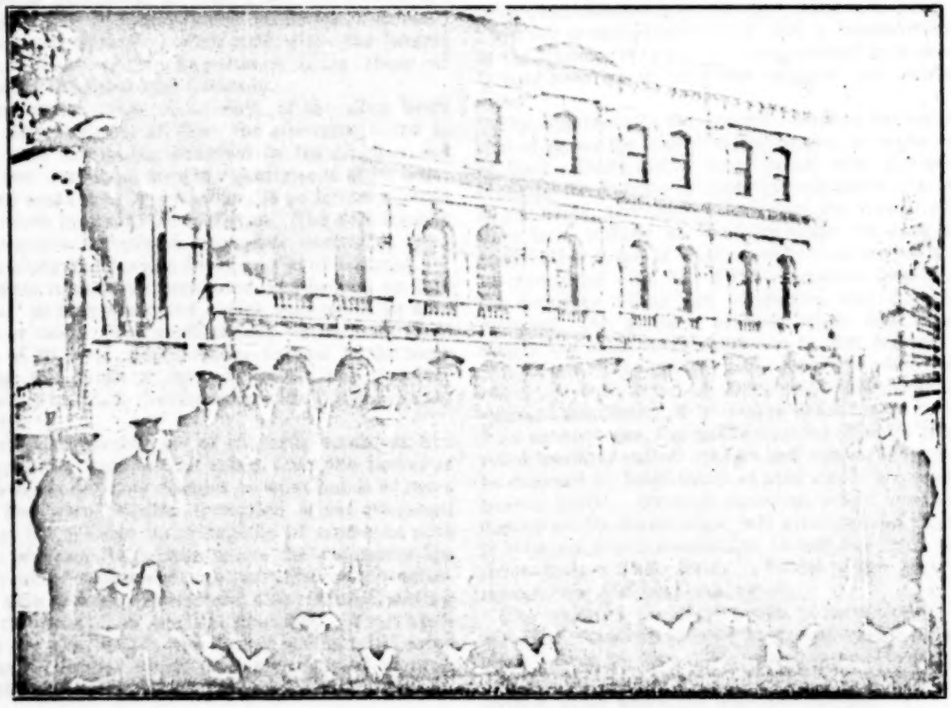
By R. C. Bishop.

We have from the inception of our business practically "nursed" our consumers, the reason being to a great extent the "personal equation" that looms so largely in all business.

My father was the first Secretary of the company, 52 years ago, and I have been with them for 43 years; therefore the developments have been under our control—and as the "staff" in the early days consisted of my father and myself, with only one man to fix meters, read indexes, and attend to complaints, everything required came through my hands, and, to a large measure, it is so to this day, as I am personally known to all our 16,000 consumers.

The exception to this is in the case of outside arc lamps. For these we make a charge of 9d. per month per lamp; this charge including cleaning twice a month, renewal of mantles, chimneys and globes, and repairs. All other shop and residence lighting we attend to "free;" and supply mantles without charge and fix them, also free, at the rate of one for every 2,000 feet of gas consumed. We found it necessary to set a minimum consumption, otherwise unprincipled people would take advantage of our system and endeavor to trade on the mantles, in fact this has been done, and we have to watch the output very carefully.

The total quantity of gas we sold during 1914 was:



"Service."—The Maintenance Men at Christchurch, New Zealand.

In 1868 our metered sales were			3½	million	cubic feet.
In 1872	"	"	5¾	"	"
In 1882	"	"	45	"	"
In 1892	"	"	64½	"	"
In 1902	"	"	120	"	"
In 1912	"	"	272	"	"

As I have been in close touch with the consumers, attention to complaints and maintenance seemed to develop so naturally that we have practically been doing it all the time.

In 1903 it became the question of a small reduction in price or still more attention. We adopted, I am glad to say, "free mantles," and very nearly general "free maintenance." The only ex-

For lighting	148,754,048	cubic feet
For cooking, heating, etc	124,711,452	"
For power	22,576,500	"
Total	296,042,000	cubic feet

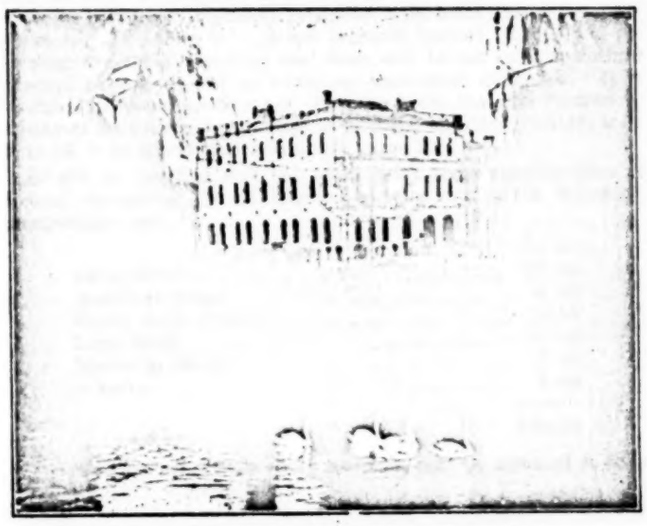
and during this period the expenditure for mantles and maintenance department was:

99,016 free mantles at cost	£1,769 17 1
Wages fixing the above, and for maintenance, cleaning, etc	2,432 3 0
	£4,202 0 1

This works out at 3.41 pence (6.82 cents) per 1,000 cubic feet on the whole sales per meter; but as the cooking, heating and power sales do not require mantles, this cost should be charged against the gas sold for lighting; therefore it will work out at:

			Per 1,000 cu. ft.
Mantles...	£1,769 17 1	÷ 148,754,000 cu. ft.	= 2.86d.
Wages	2,432 3 0	÷ " "	= 3.92d.
	£4,202 0 1		= 6.78d. (13½c.)

In addition to the men on maintenance we have what we call the "Complaint Staff," whose duties it is to attend to more serious work than the cleaning and regulating of burners and fixing mantles, their special duty being to adjust anything in connection with the meter, service or inside fittings, all without charge.



Attractive Surroundings Promote Good Merchandizing.

We endeavor, as far as possible, to regularly visit all our consumers for the purpose of giving them a general clean up. Shops, department stores, hotels, restaurants, etc., we have weekly, fortnightly or monthly lists, as we may find it necessary. Residences do not get quite such close attention, but our consumers are so used to having any complaint immediately attended to that they ring us up on the telephone, and a man is sent up sometime during the day. So accustomed have our customers become to this attention that we are rung up for everything—"another mantle wanted;" up goes a boy on a bicycle to fix it and at the same time to ask if everything is right: Again—the "kitchen maid says her light is bad"—up goes a man to fix that; probably finds a fly or moth in the air inlet; once more the telephone rings—Mrs. A. says, "the pilot light has gone out in the dining room;" up goes a man and finds a strong draught between door and window has blown out the pilot, strikes a match and everything is right again. And so the work of this department attends to some hundreds of calls every day, most of them trivial, some serious, but all receive prompt and courteous attention; with the result that our consumers hold us in better esteem than otherwise would be the case.

Being in constant touch with our consumers gives them a feeling of community of interest, which certainly is to our advantage in our strenuous competition with electric light. All cookers, fires, gas irons and other apparatus are examined when necessary, and cleaned and adjusted free.

We have a highly trained lady cooking demonstrator, who gives free lectures in our hall every Wednesday afternoon. The rest of her time, during the week, is employed in attending appointments with ladies who have experienced some little difficulty with their cookers, or who wish information before installing one.

It has always appeared to me to be only common sense to give the consumer 100% of the light they purchase. It is not only fair to the consumer, but it keeps us in personal touch with them all, with the result that the gas-man is always a welcome visitor. Again we are all proud, from myself to the youngest boy, to see all window lighting clean and bright, mantles full and sparkling; and this I am fully convinced is more satisfactory than a few cents reduction in price.

We have had many arguments amongst the different Companies in New Zealand as to which is the best policy; a slight reduction in price, or efficient maintenance service with free mantles. After twelve years experience of the latter, I pin my faith to that policy, as I am more than ever convinced that it is enabling us to meet the very keen competition from the Government Hydro-Electric Installation, locally administered with all the possible energy of our Municipal Corporation.

The photograph shows our maintenance staff. We have them in a neat uniform, with the company's badge on the cap. This we find very advantageous; not only does it look business like, but it is a safeguard, and guarantees our consumers against the possibility of "crooks" visiting the premises for improper motives, as has been done more than once here. Every man in our employ who has to go inside a house, whether index clerk, meter waterer, gas fitter, complaint or maintenance hand, is either in uniform or wears a badge. All badges are numbered. The uniforms are supplied by the company, the cap and badge free. The men pay half the cost of the jacket and trousers, the reason for this being they take much better care of them, and it provides them with very cheap clothing.

Accidents that Could have been Prevented.

[From reports of MR. J. B. DOUGLAS.]

A particle of foreign material entered the eye of a caulker, and in trying to remove it with a toothpick he injured the eyeball.

Eyes have been lost through just such acts as this. The proper thing is to report to the foreman and obtain relief in the right way.

A laborer scratched his finger on a rusty drip pot, and failed to have the wound treated. Infection resulted, and he was laid up for three weeks.

First Aid cabinets are provided to take care of such accidents, and it pays to use them.

A workman was using a ladder, putting covering on an overhead steam line, the ladder slipped, and in trying to avoid a fall, he clutched the pipe, and the ends of two fingers were cut off by a tin band of the pipe covering.

Had the ladder been equipped with spurs or ladder feet, the accident probably would not have occurred.

A junk dealer left his team standing near a holder pit in a gas works yard, and one of the horses fell into the pit.

Almost any kind of a guard would have prevented this accident.

The top rung of a ladder, resting against a post, pulled out from the standards, causing a man to fall to the ground.

Inspection, would in all likelihood, have prevented this accident.

A laborer, using a 3-foot iron chisel to remove bricks from a stack, cut his hand on its burred head.

Where tools with mushroomed heads are used there is always a probability of injury.

A cashier suffered injury to his eyes from improper lighting conditions, and light constantly reflected by a glass counter.

Proper lighting is essential, and conditions, such as in this case, should be eliminated promptly. There can be no excuse for bad illumination in the gas and electric business.

While cleaning the calibrated cock from a copperas supply tank to a cyanide scrubber, copperas solution splashed into the eyes of an engineer.

The use of a face mask would have prevented this accident.

An employee, in a meter repair shop, was badly cut in the arm by a strip of tin, while skylarking.

Play is all right, and important in its place, but the workshop is no place for it.

As a coke buggy was being dumped, one of the wheels came off and a gas maker was injured by the falling buggy.

Inspection of all equipment is imperative, and probably would have prevented this accident.

MANUFACTURE OF SILICA BRICK FOR THE BY-PRODUCT COKE OVEN.

From paper by KENNETH SEAVER, to the San Francisco Meeting, American Institute of Mining Engineers.

It is gratifying, that although in the manufacture of refractories as a whole, foreign practice has surpassed us, the United States stands pre-eminent in the making of silica brick. In some instances European manufacturers refused to credit the possibility of making to such specifications as are common with us, until the completed shapes were shipped for inspection. But both the manufacturer and consumer in foreign lands are now benefiting by our advanced practice in this field, as is evidenced by the orders placed here, and the efforts abroad to come up to the standard of American-made material.

In no operation has the employment of silica brick spread with such leaps and bounds as in the carbonization of coal, particularly in the by-product coke oven. To-day, in practically all types of oven, the structure above the floor level (except the facings) is of silica, while in the recuperative and in some regenerative types, its use is extended below the oven floor as well.

Because there are a number of refractories of higher silica content than the usual so-called fire-clay brick, there is somtimes a confusion as to what is meant by "silica" brick; we here refer only to a brick having a silica content of 94% or more, made usually from quartzite rock with a small percentage of lime as a binder.

The term "silica" brick is somètimes rather loosely applied to brick made from highly siliceous clays, or to a quartzite refractory of mingled fire-clay and quartz rock; but such products are not considered in this discussion.

MATERIALS.

The rock from which practically all high-grade silica brick are made is a true quartzite or metamorphosed sandstone, variously known as ganister, quartz, quartzite, silica rock, etc.—the largest fields, in the order of their relative importance being those of Pennsylvania, Wisconsin, Alabama and Colorado.

Pensylvania manufactures from 75 to 85% of the silica brick made in the United States; nearly all from the quartzite found in the Medina and Oneida formation, quarried in Huntingdon and Blair counties. In this restricted area the quartzite is at its best; toward the north and south it becomes softer, is no longer a true quartzite, or is too much impregnated with iron. The rock is easily accessible in the counties mentioned, enormous quantities lying loose on the surface along the Juniata River and its tributaries.

In the course of time it has been weathered and broken up into loose rock or "floes," as they are called, which may cover an area of a thousand acres or more. The depth usually varies from three or four to as much as 20 feet. Smaller floes formed in the same way are found along the flanks of the mountains; but they nowhere compare in size with those formed where the measures have been cut transversely.

This rock is sometimes quarried out of the solid measures, but by far the largest quantity used is that taken from the bodies of loose rock, as the latter is not only cheaper to work but is of more uniform quality. The white Medina formation is not composed entirely of quartzite, but is made up principally of sandstone with intermingled strata of quartzite. Thus, where the formation has been broken up, the softer sandstones unsuitable for the manufacture of silica brick have weathered away and disintegrated, leaving the larger part of the floes consisting of quartzite. When sandstone is mixed with the quartzite in the floes it is readily detected by its appearance, as it becomes much more rounded and worn in weathering than the quartzite, which retains its sharp angular edges.

The individual pieces in these floes range from fist-size to boulders weighing many tons. Probably 50% of the rock occurs in pieces weighing more than 500 pounds. The largest floes are found at the gorges of the Juniata river near the towns of Mount Union, Mapleton, Point View, Lewistown, etc.

It is interesting to note that the Oriskany sandstone, extensively used as glass sand, is found in close proximity to the Medina, and that although exceedingly pure in its composition, its softness renders it unsuitable for high grade silica brick. It consists of a mass of minute quartz grains, loosely held together, and often so friable that it can be easily worn away by the hands. On the other hand, the Medina quartzite consists of quartz crystals cemented in a mixture of the same composition. The difference in the two types of rock, when ground for the manufacture of brick, is obvious. The harder stone gives splintery, angular fragments; the other, rounded grains. Experience shows that a hard rock like the Medina is required for physically strong silica brick.

A representative analysis of the Pennsylvania quartzite is as follows:

	Per Cent.
Silica (SiO_2)	97.80
Alumina (Al_2O_3)	0.90
Ferric oxide (Fe_2O_3)	0.85
Lime (CaO)	0.10
Magnesia (MgO)	0.15
Alkalies	0.20
	100.00

METHOD OF MANUFACTURE.

Grinding.—After the rock, broken to one man size, is received at the brick plant, it is put through a crusher, which reduces it to practically the size of a 1 to 2" ring. It is then elevated to storage bins, from which it may be fed in weighed quantities to the wet pans for grinding.

Into the wet pans, as the grinding proceeds, 2% of lime, by weight, is introduced as milk of lime, which, when the brick is burned, serves in combination with the other elements, to give the necessary bond or physical strength.

The fineness of the grinding depends upon the nature of the brick to be made. In general, one charge, containing material for 200 bricks, will be ground, at the rate of approximately four pans per hour for standard 9" brick, while to obtain the fineness requisite for the intricate and difficult shape-work necessary in by-product coke oven construction, but two pans per hour may be possible. The rock is exceedingly hard, and a comparitively slight increase in the fineness of grind is accompanied by a seemingly disproportionate lowering of grinding capacity, and increased wear on the pans.

The difference in the ground rock lies, not so much in the actual size of either the coarse or fine grains, as in the relative proportion of fines. There can be no question that the general effect of increasing the fineness of grind is to improve the abrasive resistance of the brick, and the requirements for typical coke oven specifications have worked no hardship upon the manufacturer; for the present-day stand of workmanship oven shapes is such as to "carry its own grind with it," if the expression may be used. To secure the accurate filling out of shapes, and the clean-cut accuracy essential, the grind is actually much finer than is necessary to satisfy the usual specifications as to that feature.

Molding.—The ground silica material when ready to mold is of about the consistency of damp sand, but probably because of the extreme angularity of its grains has less flow as it is manipulated. As a consequence, the molds must be filled by pounding with heavy plank beaters, and all corners and shapes of irregular outline must be rammed by hand, much as sand molds are made, but with much heavier blows. Unequal ramming, which leaves a variation in the density of the green brick, will give unequal expansion in the kiln. It is by no means uncommon to lose hundreds of a difficult shape through such fire-cracking. To get proper molding and ramming requires the strictest supervision.

The wear on the steel molds is exceptionally severe, and they are often decidedly complicated, and always expensive, as "loose sides" must be used. The moulded silica has almost no strength, and can be taken from the mold only by allowing the sides to come with it, after which the sides are stripped.

After molding, the shapes are placed on pallets and dried, either on a steam heated hot floor or on rack cars in some form of tunnel dryer. The brick are then ready to be set in the kilns.

Burning—The majority of silica brick are burned with soft coal in the familiar type of round, down-draft kiln. The following schedule of burning may be considered as fairly normal. When the setting is complete and the doors are sealed, fire is immediately started, and continued slowly with slight acceleration for 9 to 12 days, during the last 2 or 3 of which the final temperature should be practically attained. The kiln is then held at the required temperature, say at 26 cone (1,650° C., or 3,002° F.) directly in front of the firebox, for another day; after which the fireboxes may be sealed, and allowed to remain thus for approximately 24 hours more. Cooling requires about as long as the burning.

Effect of Burning on Composition and Expansion.—In discussing the desirable qualitities of silica brick it is frequently said that "all the expansion shall be burned out of them." This brings out the questions: What is the nature of this expansion; what produces it; what is its extent, and how fully can it be controlled?

Let it be premised that all silica brick are made in molds smaller than the proposed finished or burned brick; and that under the influence of heat a permanent expansion occurs, swelling the brick from the mold or "green" size to the required or "burned" size. It is desirable that this permanent expansion be completed during burning so as to preclude further permanent expansion when in use.

Expansion will occur on heating—a true thermal temporary expansion that will disappear upon cooling; which must not be confused with the permanent expansion produced in the brick during the manufacture. If a silica brick is not properly burned, then, upon reheating in actual coke-oven use, there will be not only its normal thermal expansion, but an additional permanent expansion. It is essential in the construction of the coke ovens that the expansion, whatever its nature, be as small as possible, and that, whatever it is to be, it be known and adequately cared for.

It will be recalled that the silica brick under consideration is formed by adding 2% of lime to quartzite rock of the following composition, say:

	Per Cent.
Silica (SiO_2)	97.80
Alumina (Al_2O_3)	0.90
Ferric oxide (Fe_2O_3)	0.85
Lime (CaO)	0.10
Magnesia (MgO)	0.15
Alkalies	0.40
	100.20

The representative silica brick produced may be assumed to have the following composition:

	Per Cent.
Silica (SiO_2)	96.25
Alumina (Al_2O_3)	0.88
Ferric oxide (Fe_2O_3)	0.79
Lime (CaO)	1.80
Magnesia (MgO)	0.14
Alkalies	0.39
	100.25

What are the changes which occur as the siliceous mass is burned? Certain of them are obvious; such as the formation of a bond of one or more of the lime-silica compounds such as the metasilicate CaO, SiO_2 or 2CaO, SiO_2. With the exception of the lime present, the ferric oxide and the alumina though small in quantity are the preponderating impurities, and there is undoubtedly formed a certain amount of silicate of iron as well as compounds of the lime-alumina series. Whereas the lowest melting point incident to any eutectic of the lime-silica system is 1,436° C. (2,617° F.) and of the alumina-silica series is 1,610° C. (2,930° F.), while that of the lima-alumina system is 1,400° C. (2,552° F.), some of the eutectics of the ternary system CaO, Al_2O_3, SiO_2 melt at approximately 1,170° C. (2,138° F.) and are thus among the first of the flux compounds resulting.

No less important, though less recognized, changes occur in the brick as it is heated. The evidence of this change, is seen by the most casual measurement when brick are drawn from the kiln from time to time, as higher temperatures are reached. The final expansion will be very close to $\frac{3}{16}$" per foot. The theory of this expansion is that a change occurs in the crystalline form of the silica, an inversion from the quartz crystal to the crystalline form of crystobalite.

It must be borne in mind, that by quick burning, the brick may be easily expanded by double or treble the normal amount; but sound brick do not result. This excessive expansion is due to minute fissures opened up in the body of the brick by a sudden rise in temperature during burning. In the early stages of firing the heat must be raised very slowly.

New Methods and Appliances.

A CONCRETE LAMP-POST ADAPTABLE TO GAS.—Concrete lamp-posts are being used extensively on the boulevards of Lincoln Park Chicago. During the past year 133 were installed, making a total of 947 now in service. They were designed by John Hamilton, of Perkins, Fellows and Hamilton of Chicago. The design is copyrighted.

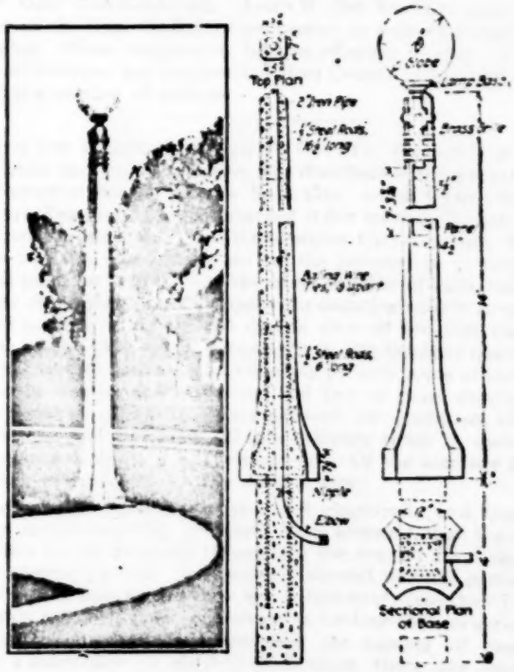
The body of the post is composed of very dry concrete—1 part cement, 1.5 parts torpedo sand and 2.5 parts of of $\frac{1}{2}$" to $\frac{3}{4}$" limestone. The surface dressing above ground consists of $\frac{1}{2}$" of 1:1: $1\frac{1}{2}$ mortar composed of cement, torpedo sand and fine red granite screenings. To this mortar is added 5 pounds of mica for each post. The mold for the portion above ground is of cast iron. It consists of a base and two sides like a trough. This is bolted to a wooden form (also in the shape of a trough) for the portion of the post that goes below the ground.

To prevent sticking, the mold is given a light coat of cheap machine oil before the concrete is put in. The bottom of the iron trough and about 2" on each side are coated with the surface mortar. Dry concrete to form the body is then introduced and a reinforcing bar placed in each corner. The sides are then lined a little higher with mortar, and more concrete added. At the center a 2" cast-iron pipe is placed to carry the wires. The sides are lined with mortar and the trough almost filled with concrete, a reinforcing rod being placed in each upper corner.

The top is then covered with the surface mortar, leaving the mold a little more than full; the top or lid of the mold being then put on and bolted into place, forcing the concrete into all lines and corners of the mold. The portion of the post below ground receives no surface dressing.

The post is allowed to remain in the mold 24 hours, after which the top and the sides are removed, so that curing can proceed more rapidly. The bottom mold is usually removed after 48 hours and complete drying of a post takes about 120 hours.

When the post is completely dry the surface is quickly brushed with muriatic acid, which removes all the cement on the outer surface and leaves a finish resembling natural granite. As soon as the post has been completely covered with acid it is drenched with water and brushed over with a broom to prevent the acid from attacking the body of the post. The finished post weigh 2,000 pounds, and the cost of manufacture from $16 to $19 each.



Concrete Lamp-Post of the Lincoln Park Commission in Chicago.

In erecting these posts a hand-power derrick mounted upon a large wagon is used. The post is set in a prepared hole and concrete 12" thick placed around the base.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

THE P. H. & F. M. Roots Co., Connersville, Ind., have the contract for two gas exhausters and two gas boosters for the Indiana Coke and Gas Company, to be installed in their new coke oven plant at Terre Haute, contracts for which were awarded to the Gas Machinery Company, Cleveland. O.

MR. H. M. BYLLESBY has been appointed a member of the Public Service Corporations Committee of the Investment Bankers Association of America.

THOMAS J. AGNEW, vice-president and operating head of the United Gas and Electric Improvement Company, of Merida, Yucatan, Mexico, died suddenly in New York city, on December 22nd. Mr. Agnew was born in Philadelphia, and for the last 16 years lived in Merida. As an expert, he established gas plants in many parts of Mexico, and served as an authority on oil properties there. Accompanied by his wife, Mr. Agnew came to New York in September, to supervise the organization of the Agnew Oil Corporation, of which he was the founder. He decided a few days ago to spend the winter with Mrs. Agnew in Havana, Cuba, and preparations were being made to that end when his death occurred.

THEY have had this so often that it seems "Natural." Following its custom during cold weather, the Union Gas and Electric Company yesterday notified many of the large commercial users that their supply of gas would be temporarily shut off, to protect domestic consumers. "In our contract with these firms it is specified that they will receive gas when we have it to spare," explained President W. W. Freeman. "They will use coal for a time, and when it gets warmer gas will be turned on again."

THE Laclede Gas Light Company gave a Christmas entertainment for its employes and their families, nearly 5,000 persons in all, at which the guests regardless of race or religion, shook hands with the officers and directors, and received refreshments and presents. Individual invitations were sent to all employes asking them to bring their families to the company's offices the day before Christmas. After shaking hands, the guests were served refreshments, and then presents were distributed. In selecting the presents careful attention was given to the ages of the employes and the members of their families. It was found that there were 1150 children from 1 week to 16 years old, and 1750 children altogether. Everything chosen for presents was selected with care for each person. Each wife or mother received a small suit case containing a present, and in this she carried away the presents given the members of her family.

WAYCROSS, Ga., has at last gotten some real cash in connection with the city's efforts to have a gas plant. In granting the latest franchise, about its fifth, the city stipulated that a cash guarantee of $1,000 should be deposited as evidence of good faith. The $1,000 has been paid in by the holders of the franchise, who expect to begin work on a plant that will cost $150,000, not later than Feb. 1.

CAN you beat it? There were 882,678 gas meters in use in the Boroughs of Manhattan and the Bronx during the month of November. At the request of consumers, 62 meters of the above number were tested by the Public Service Commission, First District. Thirty-one of the 62 meters were registering correctly; 8 were 2% or more "slow," and 23 were 2% or more "fast."

THE new gas plant of the Santa Barbara (Cal.) Gas and Electric Company, is completed and running. The largest oil gas generator has a capacity of 1,250,000 feet of gas in 24 hours. The present output is 500,000 feet a day, but Manager Sterling believes that within two years Santa Barbara will demand 750,000 feet, and he and his company will see to it that that or any other demand is met. J. M. Berkley of Los Angeles, gas engineer and superintendent of the gas department of the Southern California Edison Company, has had direction of the work, assisted by H. W. Dennis, chief engineer of the construction department, and E. P. Dunbar, superintendent of construction. In the new plant the company has made admirable provision for the comfort and convenience of its employees. Dressing rooms are provided for them, with lavatories, shower baths and lockers, and every reasonable convenience is at hand for the comfort of the workmen. The "finishing touches" will be a beautiful park on the 2-acre lot planted with shrubs and flowers.

W. A. LOUENBERGER, Superintendent of the Tacoma Gas Company has been elected Vice-President of the National Safety Council, Tacoma Local No. 23, and has been appointed a member of the committee that will prepare a constitution and by-laws.

A 25-YEAR gas franchise in Gretna, La., has been granted to McCullough Smith. The franchise becomes effective immediately. It is not exclusive. Under the terms the city will receive, as compensation, after January 1, 1916, one per cent of the gross annual profits of the concern, or its assigns, and Mr. Smith has forty days within which to accept the terms of the franchise, six months to commence the construction of the system, and one year within which to complete it and begin furnishing gas. The rate to ordinary consumers is fixed at $1.40 per 1000 cu. ft., plus 10 cents per 1000 cu. ft. should bills not be paid by the tenth of each following month. Special rates can be made with industrial concerns according to the amount of consumption. The minimum charge is fixed at 50 cents per month, where the consumption is less than 300 cu. ft., and a cash deposit of $2.50 can be required of consumers for lighting purposes, $5 for fuel, cooking and lighting, and larger deposits, according to consumption, from industrial concerns, all deposits to bear 4 per cent interest.

BIDS have been received by the North Adams (Mass.) gas light company for the erection of an addition to their plant 20 feet wide and 55 feet long, of brick factory construction, two stories high. It will be used to house a new eight-foot water gas set. The new set will more than double the capacity of the present plant.

THE main features of the offer of the Peoples Gas Light and Coke Company to the city of Chicago include the following: Reduction of the city's candlepower requirement from 22 to 16; heat units furnished to remain the same. Construction within three years, at an estimated cost of $24,000,000, of a coal gas plant on the drainage canal. All saving in coal gas manufacture, in comparison with present methods, remaining after 7% on the $24,000,000 additional investment has been taken by company, to be applied to reduction in rates. City to withdraw its suit to collect for consumers the $10,000,000 in excess of ordinance rates collected by the gas company in the last five years, and to refrain from pushing its petition asking the State Public Utilities Commission to revise the gas rates. Present rate of 80 cents a thousand cubic feet to continue until the completion of the new plant in 1919; although the injunction establishing the rate goes out with the ordinance on Aug. 10, 1916.

THE Knoxville (Tenn.) Gas Company will bid on furnishing a part or all of the street lights for the city in connection for a new municipal lighting contract. Manager A. W. Young discussed the gas-lighting proposition with Mayor McMillan and offered to illuminate a dark street corner with gas light to show the commissioners what great improvements have been made in gas street lighting. Mr. Young stated that the impression that returning to gas lighting is a retrogression, is entirely erroneous. "In fact, some of the most progressive cities of this country are installing gas lights in preference to electric arcs, because they have found them to be more economical, more reliable, and give better light. There is no section of the city which cannot be supplied with gas lights. We have a system of mains that is complete, and we are in a position to give Knoxville the very best in street lighting at the lowest possible figure."

THERE is a controversy on as to who shall supply the city of Idaho Falls with a gas plant, a second application for a certificate of public convenience and necessity having been filed with the Public Utilities Commission. The application is from William D. Wilcox, a resident of Chicago, who submits with his application a franchise proposing to give him certain rights in the city. On or about June 1, 1916, Wilcox says, he will be prepared to begin the construction of a plant, and will have it completed, including the installation of six miles of main and be prepared to supply gas by October 1, 1917.

THE Utah Light and Traction Company is taking advantage of exceptionally fine winter weather to push its main laying in Ogden. It is planned to reach the greater portion of all the residential districts of the city with gas mains in the course of the next eighteen months.

MR. J. P. MACSWEENEY is Manager Domestic Sales Department of the Rochester (N. Y.) Railway and Light Company, succeeding Karl A. Schick. Mr. I. Lundgard is Industrial Engineer and Manager Industrial Fuel Department of the company.

MR. W. S. GUITTEAU has joined the sales force of the Stacey Bros. Gas Construction Co., Cincinnati, O. He is now in a position to sell you a whole works or any part of one.

THE Sheboygan (Wis.) Gas Light Company is planning to lay three miles of mains next year at a cost of about $25,000. It is proposed to lay mains from the intersection of South Water street and Thirteenth street south to Maryland avenue, from Maryland avenue to Eleventh street, from Eleventh street to Indiana avenue, with a large amount of "tieing-in" on the South side. It is also planned to lay a main from Geele avenue to Fifteenth street to the city limits. The new meter reading system adopted by the company is meeting with universal approval, declares Manager Easterly. A slight delay occured on the South side the first month, the patrons getting their statements from December 15 to 23, but in the succeeding months all statements will reach patrons on the same day.

INVITATIONS have been issued by Mr. and Mrs. Donald MacDonald, of Louisville, Ky., for the wedding in that city on Jan. 6, of their daughter, Miss Laetitia MacDonald, to Wallace Irwin, the author, and a brother of Will Irwin, of New York City. The engagement was announced on Nov. 15 last. Miss MacDonald has written several successful vaudeville sketches.

THE proposal to wipe out 5,000 gas street lights in Minneapolis, and to substitute therefore about 1,000 electric arc lights, encountered numerous snags, when a special council committee met to give it consideration. A number of citizens protested that the gas lights gave their streets the kind of lighting they desired, and that they objected to the change. They argued that the gas lights, being distributed at frequent intervals along the block, give a more uniform light, while the arc is brilliant at the corners only, and leaves the middle of the block dark. Others protested that they did not want the brilliant arc shining into their windows.

SUIT has been filed in Independence, Kan., by the St. Joseph (Mo.) Gas Company, a subsidiary of the American Light & Traction Company, asking that the Kansas Natural Gas Company be compelled to sell it gas at wholesale at 17 cents a thousand, instead of 26⅔ cents, the price now charged. The St. Joseph Company says that, although between 1905 and 1911, its business increased more than 65%, it has not been able to make any money because of the high price charged it for gas by the Kansas Natural Gas Company. It recently asked the Missouri Public Utility Commission to approve an increase in the retail price of gas to sixty cents a thousand, but the Commission denied the request, so the company is now seeking to secure a lower cost of its gas by appeal to the courts.

THE Portland (Ore.) Gas and Coke Company is to be allowed to take over the franchise held by the St. Johns Gas Company from the town of Linton, under an ordinance before the council. It was represented that the Portland company owned the St. Johns company.

UTILITIES COMMISSION NEWS.

NEW YORK COMMISSIONER RESIGNS.—Commissioner George V. S. Williams, of the First District New York Commission, has sent his resignation to the Governor. He had one year yet to serve.

Here is his formal statemen of his reasons for retiring:

"For some time I have contemplated resigning from the commission and returning to the practice of the law, but when the latest investigation was started, I felt that I could scarcely, in justice to myself, retire while under fire.

"Now that the investigating committee has gone thoroughly into my actions, official and otherwise, and examined into my bank accounts so that my income as well as my outgo has been scrutinized, and the only criticism appearing to be directed to a tentative opinion in a gas rate case, in which certain members of the committee disagree with me, I have decided to retire with the expiration of Commissioner Cram's term on Feb. 1.

"I have accordingly sent my resignation to the Governor, to take effect on Jan. 31, at midnight, by which time I hope that the unfinished matters now before the commission can be disposed of.

"To my many friends, especially in Brooklyn, who have stood by the commission during the turbulent times since the signing of the dual contracts, I wish to express my heartfelt gratitude. Toward those who have criticised I bear no ill-will. I shall always feel proud of the part that I was permitted to take in the bringing about of the great transit improvements which are now being carried to completion, the only great improvement Brooklyn has been able to get for years, and apparently the only one she will get for years to come.

"No one has chafed over the delays incidental to the construction more than I, and I hope that from this time the work will go on more rapidly, and that my successor will be spared investigations, charges, Grand Jury inquiries, and the like, and be permitted to do his work on the commission; for the public must realize that if public officials are to exercise their best judgment and full abilities, they must be free from continuous investigations. But in saying this, I do not mean to imply that they should not be held to the fullest accountability for their public acts."

CALIFORNIA'S BUSINESS.—IN a letter transmitting the annual report of the California Railroad Commission, the following figures are given: During the fiscal year ended June 30, 1915, 675 formal applications and 241 formal cases were decided. Valuations made by the commission included the following: Railroad, $97,509,514; water, $37,100,086; electric, $30,851,930; telephone, $8,493,178; gas, $6,961,543; wharf and warehouse, $434,395; total, $181,350,646. Classified differently these items would be arranged as follows: For rate-making, $66,679,728; issue of securities, $72,360,873; sale and purchase, $5,267,900; general valuations, $37,042,145; total, $181,350,646. In 99% of the formal proceedings decided by the commission its orders have become effective without litigation, while the commission has won all of the last eleven cases reviewed by the courts.

NEW OHIO COMMISSIONER.—Louis M. Day has been appointed a member of the Ohio Utilities Commission to succeed Judge Oliver H. Hughes, whose resignation became effective on Dec. 15. Mr. Day is an attorney and represented Ross County in the Ohio Legislature for a number of sessions.

PAYING FOR TELEPHONE CALLS BY COUNT.—The Up-State New York Public Service Commission, has dismissed a complaint of the Ostro Detective Bureau of New York City, which alleged that the New York Telephone Co. had charged it for more calls than it had made from its telephone. In Commissioner Carr's opinion, though he finds that the Commission has not the jurisdiction to settle the disputed question of fact as to the exact number of calls made, he says that the system of the company for counting calls is as perfect as seems possible to devise and that in view of the fact that the counting of the calls by the company is in the hands of one skilled and highly trained operator, while many persons, some of them not even in the complainant's employ and few of them expert with the telephone or primarily concerned with its operation, counted the calls for the subscriber, all the evidence tends to show that the telephone company's count is correct. Of the accuracy of the company's counting system, the opinion says:

"The message registers are operated electrically, and from the evidence in this case they are much more accurate than the standard meters in use generally throughout the country for measuring gas and electric current. The evidence showed that the percentage of error in the message register was considerably less than 1%.

"We do not wish to be understood as holding that no errors are made by the respondent in recording the number of messages used by a subscriber in Manhattan, because there are occasions when an error might be made against the subscriber without fault on the part of either the subscriber or the company. This was clearly brought out on the hearing. It is the fact, however, that in view of the manner in which the respondent handles its business, it is very probable that the percentage of errors which are made in this way is very small."

Financial Notes.

EARNINGS of the PACIFIC GAS AND ELECTRIC COMPANY are highly satisfactory. For the 12 months ended Nov. 30, operating revenue increased $1,615,091, while the amount carried to net increased $1,085,297. The figures for the 11 months show $4,151,590 earned for dividends, an increase of $1,657,131, and an unappropriated surplus totaled $3,150,874, an increase of $1,271,397. The income account for the 12 months ended Nov. 30, 1915, compares as follows:

Gross operating revenue:	1915.	Increase.
Electric department	$9,844,145	$1,143,444
Gas department	7,557,196	553,967
Other departments	1,055,476	*82,320
Total operating revenue	†$18,456,817	$1,615,091
Expenses:		
Maintenance	$988,866	$ *55,662
Operating and general	7,165,653	236,393
Taxes	834,750	90,543
Residue against accounts	227,500	22,500
Residue for depreciation	1,333,333	294,794
Total expenses	$10,550,102	$ 588,568
Net operating earnings	7,906,714	1,026,771
Miscellaneous profits	372,301	53,525
Net income	$8,279,016	$1,080,296
Bond interest	3,937,770	4,409
Int. on 1-year notes and floating debt.	.....	$303,402
Discounts and expenses	189,654	*272,840
Surplus for dividends	4,151,590	1,657,131
Dividends first preferred	400,816	385,738
Dividends original preferred	600,000	.....
Total dividends	$1,000,716	$385,733
Surplus unappropriated	3,150,874	1,271,397

* Decrease. † Includes $399,266 in dispute on account of rate litigation in 1915, and $719,246 in 1914.

A PETITION to merge the interests owned by the NORTHERN INDIANA GAS AND ELECTRIC COMPANY, the GENERAL SERVICE CO. and the INDIANA LIGHTING COMPANY has been presented to the Indiana Public Service Commission. The companies now are controlled by the syndicate of which C. H. Geist, of Philadelphia, is president. Another petition was presented for the sale of the properties of the General Service Company and the Indiana Lighting Company to the Northern Indiana Gas and Electric Company; this being a matter of formality, as the properties which formerly belonged to what was known as the Murdock Syndicate were sold some time ago. In addition to the petition for merger, the Geist syndicate asks permission to issue $5,400,000 of 10-year 6% gold bonds, to cover the cost of purchasing the properties; Electrical and gas plants owned in Crawfordsville, Ft. Wayne, Bluffton, Lafayette, West Lafayette, Logansport, Lebanon, Frankfort, Ossian, Tocsin, Preble, Rich Valley, Tottawattomie Point, Villa North and Antioch. The Northern Indiana Company operates plants in many northern Indiana cities. The properties affected in the deal are said to be mortgaged for $4,269,000.

FOLLOWING are the net earnings available for dividends of the subsidiery companies of the MASSACHUSETTS GAS COMPANIES for November, with comparisons:

Gas department:	1915	1914	1913
Boston	$133,396	136,976	119,804
Newton	8,977	6,301	5,032
East Boston	6,452	5,947	4,562
Quincy	1,617	2,463	712
Totals	$150,744	151,687	130,110
Coal department:	1915	1914	1913
Boston T Boat	4,247	5,483	698
Federal Coal	5,843	9,272	7,221
New Eng. Gas	70,618	51,085	63,927
New Eng. Coal	40,445	26,980	29,233
Totals	$121,153	92,820	101,080
Grand Totals	$271,897	244,510	231,194

THE $900,000 in 5% bonds which the WESTERN UNITED GAS & ELECTRIC company has asked the permissian of the utilities commission to issue is for the purpose of retiring some old 6% bonds. In addition the company is asking for permission to issue $300,000 in bonds for construction work which has been paid for out of earnings, making a total of $1,200,000 for which permission is sought at present.

ABSORPTION of CONSOLIDATED GAS by interests close to the control are asserted to be the real reason for the advance in the price of that stock. The directors will hold their quarterly meeting in the last week of this month and room traders who have taken a bullish position on the stock insist that the dividend rate on the stock will be increased to 8%, although it had only been raised to 7% at the October meeting. Reports were revived of action in the direction of distribution of some of its treasury securities.

DIRECTORS of the PUBLIC SERVICE CORPORATION OF NEW JERSEY voted yesterday to put the stock on a 7% basis instead of 6, as it has been for several years.

CONTENTS.

AN ASTERISK (*) DENOTES AN ILLUSTRATED ARTICLE.

*ADVERTISING CIRCULARS, by H. Thurston Owens 1
COMMERCIAL LIGHTING, by E. M. Colquhoun 3
INCREASED TAR PRICES 5
*A SIMPLE METHOD FOR DETERMINING COST OF 1,000 POUNDS OF STEAM, by W. H. Schott 5
SELLING GAS SERVICE, by George Williams 6
*GERMAN OVENS HEATED FROM ABOVE 7
EDITORIALS 8
Happy New Year—Misleading or Only Ambiguous?—Advertising with Circulars.
SPECIAL ENGLISH CORRESPONDENCE 9
*FREE MAINTENANCE, by R. C. Bishop 10
ACCIDENTS THAT COULD HAVE BEEN PREVENTED, by J. B. Douglas 11
MANUFACTURE OF SILICA BRICK FOR THE BY-PRODUCT COKE OVEN, by Kenneth Seaver 12
NEW METHODS AND APPLIANCES 13
*A Concrete Lamp-Post Adaptable to Gas.
ITEMS OF INTEREST FROM VARIOUS LOCALITIES 14
Root's Exhausters for Terre Haute—Mr. Byllesby on Public Service Committee—T. J. Agnew dead—Not Unexpected—A Big Celebration—Waycross Promised Again—Twenty-three out of 882,678—Santa Barbara's New Plant Running—Gas Man on Safety Council Local—Gretna, La., Franchise—North Adams to Build—The Chicago Offer—Knoxville Considers Gas Street Lighting—Competition at Idaho Falls—Big Main Extensions in Ogden—Rochester Department Managers—Mr. Guitteau with Stacey Bros. Sheboygan Plans Mains—Miss MacDonald Weds Author—Minneapolis Wants Gas Lights—Tries to Get Cheaper Gas—Oregon Franchise Absorbed—And other Items.
UTILITIES COMMISSION NEWS 15
New York Commissioner Resigns—California's Business—New Ohio Commissioner—Paying for Telephone Calls by Count.
Financial Notes 16
Public Lighting Table for Jan., 1916 (Ad. Section) 7
Meeting Times of the Various Gas Associations (Advertising Section) 21